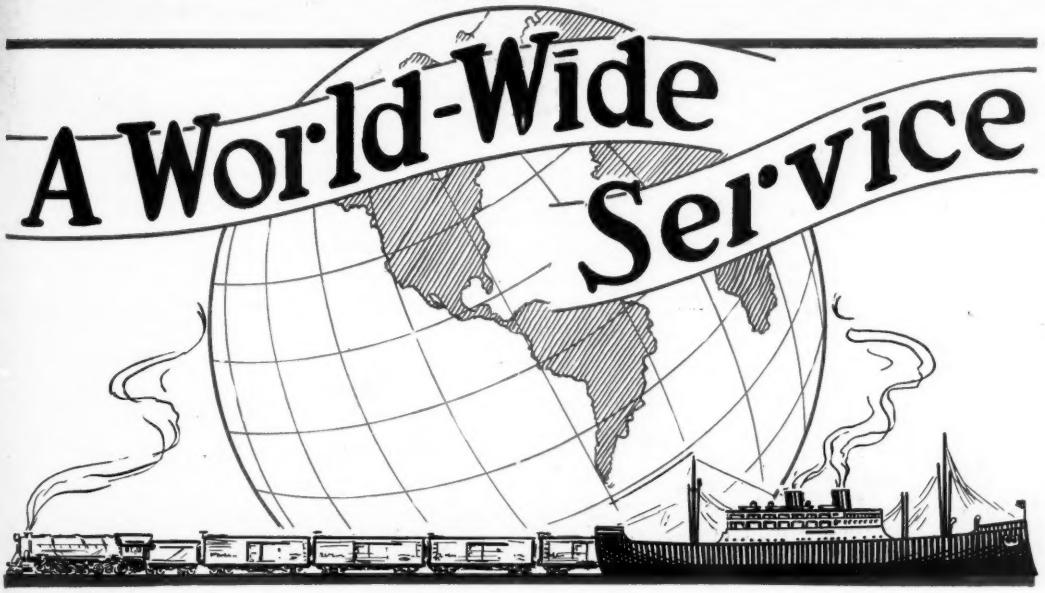
The American Fertilizer

AUGUST 17, 1940

No. 4



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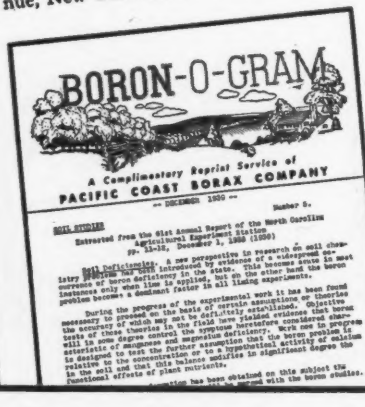
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Vol. 93 AUGUST 17, 1940 No. 4

Average Plant Food Content of Fertilizers Consumed in the United States and Its Subdivisions, 1934-1939

By A. L. MEHRING, *Associate Chemist, and* LOLA S. DEMING, *Junior Physicist, Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, Washington, D. C.*

THE total plant food content of both mixed fertilizers and of all fertilizers consumed in the United States was about 14 per cent in the early years of the fertilizer industry and remained so for many years. The average complete mixture in every year from 1880 to 1922 contained about 2 per cent nitrogen (N), 9 per cent available phosphoric oxide (P_2O_5) and 3 per cent potash (K_2O). Mehring and Peterson[1] showed that beginning about 1922 these percentages gradually increased until by 1932 the average was 3.4 per cent N, 9.5 per cent P_2O_5 and 5.1 per cent K_2O. In 1934 these figures had changed to 3.6 per cent N, 9.2 per cent P_2O_5 and 5.3 per cent K_2O, according to Mehring and Smalley.[2] No detailed study has been made for the United States for more recent years, although data have been published for certain states.

It is the purpose, therefore, of this paper to give the results of a study of the plant food content of commercial mixed fertilizers, as well as of all commercial fertilizers consumed in each state and in the United States by years from 1934 to 1939, inclusive.

Sources of Information

The principal sources of information for a study of this kind are state fertilizer tonnage reports, fertilizer grade surveys and state fertilizer control reports giving guarantees and results of analyses of samples.

Annual tonnage reports give, as a rule, the numbers of tons of each grade of commercial mixture and of each kind of fertilizer material sold to farmers. These reports are compiled annually by various state agencies from statistics supplied by manufacturers for Puerto Rico and 24 states.

In addition, incomplete surveys covering single years have been made by state agencies for a half dozen other states. Incomplete surveys, while not entirely satisfactory, nevertheless give valuable information.

Grade surveys, the second source of data, giving substantially the same kind of information as state tonnage reports, have been made for nearly all states and Puerto Rico for the fiscal year ending June 30, 1934, and for some of the states for more recent years by the National Fertilizer Association, which, for convenience, will be referred to hereafter as the N. F. A. The 1934 results were published by Mehring and Smalley.[2] More recent results for various states have been issued in mimeographed form by the N. F. A.

The third source of information mentioned above is state control reports. These are bulletins giving the results of chemical analyses of samples of fertilizers collected during the current season in comparison with the guaranteed minimum plant food content. In some states the actual analyses on the average conform very closely to the guarantees, but in most states the

(Text continued on page 11)

[1] Mehring, A. L., and Peterson, A. J., Changes in Composition of American Fertilizers, 1880-1932. U. S. Dept. Agr. Circ. **315**, 1-20 (1934).

[2] Mehring, A. L., and Smalley, H. R., A Survey of Plant Food Consumption in the U. S. for the Year Ended June 30, 1934. With an introduction by C. J. Brand. Proc. 11th Ann. Convention of N.F.A. 138-203 (1935).

Table I

Average Plant Food Contents and Tonnages of Commercial Fertilizers Consumed in the States and Territories of the United States by Years

State	Year	All Mixed Fertilizers				All Fertilizers			
		Available				Available			
		N Per Cent	P_2O_5 Per Cent	K_2O Per Cent	Tonnage Short Tons	N Per Cent	P_2O_5 Per Cent	K_2O Per Cent	Tonnage Short Tons
Alabama	1934	3.49	9.52	4.60	243,187	5.2	8.4	4.0	366,284
	1935	3.67	9.29	4.63	294,290	5.1	8.5	4.1	422,400
	1936	4.21	8.62	4.66	352,629	5.1	8.6	4.2	468,800
	1937	4.40	8.73	4.78	459,854	5.3	8.4	4.4	629,260
	1938	4.44	8.50	4.83	338,563	6.25	7.63	3.87	531,000
	1939	4.5	8.4	4.8	375,000	6.3	7.5	4.0	550,000
Arizona	1934	6.8	11.5	6.8	10	6.9	12.5	0.1	2,000
	1935	6.6	14.0	0.8	500	7.5	15.0	0.5	3,393
	1936	6.5	13.6	1.4	1,200	8.0	22.5	0.4	4,000
	1937	6.3	12.5	2.0	3,000	12.5	11.0	0.7	10,500
	1938	6.5	13.4	1.5	2,800	17.2	10.6	0.6	6,500
	1939	5.95	14.34	0.72	2,712	10.59	16.43	0.28	7,013
Arkansas	1934	3.90	10.35	4.99	22,778	5.84	6.99	3.56	45,548
	1935	3.55	9.36	3.93	20,076	6.80	6.52	3.13	39,630
	1936	3.7	9.3	4.6	26,200	6.9	6.7	4.0	48,931
	1937	3.82	9.37	5.15	41,200	7.60	6.10	4.06	68,675
	1938	3.85	9.48	5.50	36,000	7.44	6.22	4.44	67,800
	1939	4.17	9.23	5.48	36,045	6.75	5.95	5.10	71,138
California	1934	6.9	8.8	6.1	48,500	12.19	6.50	2.55	148,509
	1935	6.9	9.1	6.4	57,300	11.82	6.68	2.70	178,701
	1936	7.1	9.0	6.3	72,100	12.16	6.60	3.12	207,311
	1937	7.2	8.8	6.3	84,500	12.28	6.45	2.86	232,795
	1938	7.1	9.3	6.5	71,200	12.41	6.44	2.95	208,353
	1939	7.0	10.4	6.9	66,750	12.60	6.85	3.07	215,667
Colorado	1934	4.5	12.6	3.9	400	2.3	38.1	0.7	1,914
	1935	4.6	12.0	4.0	300	1.2	34.5	1.0	1,200
	1936	4.5	12.8	4.6	200	0.5	40.6	0.5	2,000
	1937	4.7	12.7	4.7	800	1.5	38.1	1.5	3,500
	1938	4.8	12.6	4.9	1,700	5.9	22.5	2.4	4,393
	1939	4.95	12.47	5.04	1,500	3.67	29.37	2.00	4,578
Connecticut	1934	5.06	8.04	6.60	30,414	5.36	8.30	6.23	48,373
	1935	5.2	8.1	6.8	31,650	5.3	8.3	6.3	51,007
	1936	5.3	8.2	6.9	32,500	5.4	8.3	6.4	52,897
	1937	5.3	8.2	7.2	38,200	5.5	8.3	6.4	67,236
	1938	5.4	8.3	7.4	30,200	5.6	8.3	6.5	52,000
	1939	5.47	8.37	7.61	31,000	5.62	8.25	6.54	59,000
Delaware	1934	2.27	9.15	6.32	27,500	2.26	9.63	5.90	35,700
	1935	2.4	9.1	7.1	30,200	2.4	9.7	6.7	37,800
	1936	2.5	9.1	7.7	31,000	2.5	9.6	7.5	39,000
	1937	2.8	9.1	7.8	38,000	2.7	9.5	7.6	44,466
	1938	3.1	9.1	7.9	33,000	2.9	9.4	7.7	38,000
	1939	3.61	9.07	7.99	31,000	3.16	9.33	7.82	35,500
District of Columbia	1938	4.6	9.0	5.1	1,000	4.6	10.8	3.7	1,500
	1939	4.67	9.18	5.25	1,050	4.59	11.00	3.86	1,800
Florida	1934	4.52	7.90	6.72	338,000	5.53	7.08	6.42	423,032
	1935	4.4	7.6	6.7	334,000	5.5	6.8	6.4	418,239
	1936	4.6	7.7	6.7	409,000	5.3	6.9	6.4	512,577
	1937	4.5	7.6	6.8	425,000	5.1	6.9	6.5	579,399
	1938	4.4	7.7	6.9	398,000	5.0	6.8	6.5	555,475
	1939	4.44	7.73	7.05	406,000	4.83	6.90	6.47	556,782
Georgia	1934	2.62	9.18	3.95	446,000	4.19	8.23	3.74	549,275
	1935	2.7	8.8	4.3	426,000	4.5	8.0	4.0	617,439
	1936	2.8	8.8	4.4	461,000	4.6	8.0	4.1	684,522
	1937	2.9	8.9	4.6	587,000	4.9	8.1	4.2	866,360
	1938	3.1	9.0	4.8	527,000	5.0	8.1	4.4	768,323
	1939	3.54	8.97	4.97	551,000	5.17	7.96	4.57	736,179
Hawaii	1934	10.	7.	6.	40,000	13.5	6.4	4.9	140,000
	1935	10.	7.	6.	39,000	14.0	6.4	5.0	133,000
	1936	10.	7.	7.	30,000	14.0	6.5	6.5	118,000
	1937	10.	7.	7.	38,500	14.1	6.7	7.5	123,000
	1938	10.	7.	8.	37,800	14.4	5.9	8.4	122,000
	1939	10.	7.	8.	37,000	15.0	5.5	8.8	120,000

Table I (*Continued*)

State	Year	All Mixed Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	K_2O Per Cent	Tonnage Short Tons	All Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	K_2O Per Cent	Tonnage Short Tons
Idaho	1934	3.50	9.9	11.8	20	0.9	42.5	0.3	2,012
	1935	4.0	10.0	10.0	600	1.5	29.8	2.1	3,000
	1936	4.8	9.0	6.5	500	1.2	34.8	1.1	3,000
	1937	5.0	9.0	10.0	1,000	1.3	36.7	1.0	6,500
	1938	4.3	9.3	10.5	2,000	0.7	28.8	2.7	9,015
	1939	3.9	9.3	12.9	500	0.05	44.32	0.03	5,373
Illinois	1934	2.47	11.84	7.93	12,024	3.90	12.55	5.76	18,977
	1935	2.29	11.86	8.33	15,381	4.03	12.12	6.60	23,827
	1936	2.40	11.87	8.38	22,576	3.06	12.61	7.16	31,308
	1937	2.17	11.98	8.70	26,524	3.11	12.53	7.56	36,076
	1938	2.30	12.30	8.93	29,330	3.03	11.96	8.64	36,132
	1939	2.21	11.95	9.40	32,296	1.27	6.41	3.97	*91,493
Indiana	1934	1.81	12.58	7.28	111,191	1.68	13.30	6.91	140,526
	1935	1.88	12.84	7.03	159,477	2.08	13.42	7.73	194,944
	1936	1.95	12.63	7.41	180,535	2.10	13.61	7.84	254,108
	1937	1.85	12.88	8.37	195,618	2.19	13.47	8.57	226,887
	1938	1.80	12.67	8.50	179,160	1.76	13.35	8.24	220,967
	1939	1.76	13.52	8.69	179,000	1.82	13.46	8.23	201,420
Iowa	1934	1.56	12.05	13.07	2,930	1.16	14.20	8.06	5,000
	1935	1.8	12.4	11.5	4,000	1.4	14.4	8.0	5,000
	1936	1.98	12.82	9.94	4,696	1.66	14.44	7.80	6,403
	1937	2.1	12.7	9.7	5,800	1.7	15.0	7.3	8,523
	1938	2.12	12.66	9.50	7,488	1.64	15.59	6.79	11,091
	1939	2.04	12.75	9.30	7,544	1.56	14.28	5.59	13,019
Kansas	1934	2.57	11.92	2.95	1,780	1.79	19.30	1.03	5,499
	1935	2.16	13.75	2.50	3,200	1.70	18.58	1.30	7,298
	1936	1.96	13.92	2.36	5,000	1.47	18.44	1.21	11,170
	1937	2.2	12.3	3.1	6,200	1.1	24.5	1.6	15,267
	1938	2.36	12.29	3.26	3,621	0.72	27.14	1.85	13,828
	1939	2.31	12.16	3.25	4,120	1.18	22.60	1.01	14,365
Kentucky	1934	2.70	9.78	4.81	37,010	2.26	13.60	2.88	62,520
	1935	2.7	9.8	4.9	41,800	2.3	14.0	2.8	73,502
	1936	2.69	9.78	4.97	49,200	2.15	14.24	2.77	89,392
	1937	2.7	9.7	5.1	61,000	2.1	14.4	2.7	117,078
	1938	2.9	9.7	5.1	57,800	2.5	14.6	3.0	109,968
	1939	2.98	9.63	5.35	60,400	1.87	15.4	2.99	111,201
Louisiana	1934	3.59	10.93	4.45	40,481	8.61	8.04	2.60	80,945
	1935	3.88	10.53	4.31	50,304	8.21	8.06	2.89	92,532
	1936	4.25	10.41	4.26	51,500	9.45	7.07	2.62	117,106
	1937	4.30	10.18	4.45	90,100	8.84	7.23	3.13	157,197
	1938	4.33	10.06	4.58	82,143	8.59	7.26	3.21	149,002
	1939	4.37	9.93	4.75	81,891	8.40	7.18	3.25	140,385
Maine	1934	5.23	9.67	11.00	125,100	5.35	9.16	11.30	138,000
	1935	5.4	10.0	11.3	108,000	5.6	9.6	11.7	125,000
	1936	5.6	10.3	11.6	119,000	5.7	9.6	12.2	130,000
	1937	5.6	10.5	12.0	126,000	5.7	9.9	12.5	140,000
	1938	5.7	10.7	12.5	125,000	5.8	10.5	12.5	140,000
	1939	5.86	10.91	12.99	127,000	5.78	11.07	12.58	132,500
Maryland	1934	3.04	8.17	6.00	123,872	2.70	9.86	5.46	146,439
	1935	2.81	9.47	6.59	142,659	2.72	10.06	6.06	164,843
	1936	2.86	9.49	6.78	145,237	2.84	9.99	6.27	164,817
	1937	2.85	9.50	7.11	160,301	2.86	9.95	6.62	186,285
	1938	2.97	9.55	7.23	143,081	2.93	10.09	6.67	166,408
	1939	2.97	9.68	7.43	146,978	2.98	10.18	6.89	164,585
Massachusetts	1934	5.08	8.83	7.17	42,267	5.58	8.78	5.94	60,504
	1935	5.20	8.80	7.10	42,923	5.65	8.65	5.82	63,208
	1936	5.18	8.53	7.07	43,682	5.67	8.40	5.92	64,481
	1937	5.25	8.53	7.15	48,527	5.60	8.81	5.83	74,274
	1938	5.30	8.55	7.49	45,339	5.60	8.55	6.03	69,175
	1939	5.29	8.78	7.60	41,616	5.54	8.95	6.44	63,974

* Includes a large tonnage of phosphate rock.

Table I (*Continued*)

State	Year	All Mixed Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons	All Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons
Michigan	1934	2.20	12.31	6.92	67,019	2.50	12.86	6.00	82,704
	1935	2.19	12.36	7.13	91,836	2.21	13.17	6.21	111,288
	1936	2.18	12.27	7.20	100,190	2.42	12.77	6.52	125,693
	1937	2.23	12.58	7.53	121,680	2.19	13.32	6.77	144,500
	1938	2.40	12.67	7.64	113,463	2.40	13.23	7.05	132,702
	1939	2.36	12.41	7.93	123,914	2.46	12.94	7.39	144,811
Minnesota	1934	1.96	10.80	17.61	6,400	1.90	13.55	13.47	9,165
	1935	1.89	11.43	16.23	7,498	2.05	14.32	12.21	10,776
	1936	2.24	11.58	14.51	7,822	2.33	13.66	11.61	9,899
	1937	2.21	12.38	13.74	9,024	2.22	16.83	10.13	12,386
	1938	2.35	12.46	13.07	9,991	2.63	14.93	9.62	13,778
	1939	2.49	12.79	12.73	10,119	2.64	15.59	9.72	13,461
Mississippi	1934	3.95	8.60	4.13	102,194	6.99	7.39	2.97	163,598
	1935	4.01	8.69	4.19	92,245	7.49	7.25	3.22	214,015
	1936	4.05	8.66	4.23	107,213	8.67	6.36	2.86	239,027
	1937	4.23	8.58	4.41	148,441	8.56	6.72	3.36	300,562
	1938	4.33	8.52	4.66	141,343	8.67	6.32	3.81	264,242
	1939	4.54	8.46	4.98	138,437	9.70	5.79	3.67	285,667
Missouri	1934	2.21	12.82	3.01	26,340	1.77	16.09	1.72	52,259
	1935	2.23	13.18	3.23	35,350	1.89	15.71	2.12	59,398
	1936	2.26	13.47	3.41	54,100	1.73	15.85	2.22	93,588
	1937	2.21	13.01	3.46	49,800	1.70	15.26	2.38	82,498
	1938	2.25	13.01	3.87	39,800	1.62	15.59	2.61	70,301
	1939	2.30	12.91	4.17	37,400	1.57	15.88	2.55	67,733
Montana	1934					0.1	44.7	0.1	2,340
	1935	5.4	10.9	6.4	200	0.8	38.2	0.5	3,000
	1936	4.7	12.1	6.0	500	0.7	36.1	0.8	3,770
	1937	5.5	12.1	5.7	500	1.5	39.7	1.2	5,000
	1938	5.7	12.8	6.0	500	1.8	38.4	1.1	5,000
	1939	5.4	13.2	5.1	500	1.5	38.7	1.0	5,000
Nebraska	1934	3.9	10.3	8.4	28	1.4	40.7	0.3	900
	1935	4.0	10.5	8.0	50	3.0	34.9	0.6	800
	1936						43.4		700
	1937	4.0	10.5	7.0	100	1.3	38.0	1.0	1,500
	1938	3.5	10.5	6.7	200	2.1	34.6	0.4	1,794
	1939	5.4	10.8	5.8	150	0.8	39.4	0.5	2,090
Nevada	1934	4.	12.	4.	10	4.9	17.2	3.7	50
	1935	5.	11.	4.	100	6.	14.	3.	300
	1936	5.	11.	5.	100	5.	20.	2.	400
	1937	6.	11.	4.	200	4.	24.	2.	500
	1938	6.	12.	5.	200	4.	26.	2.	500
	1939	4.	12.	4.	200	2.	35.	2.	500
New Hampshire	1934	5.05	9.37	8.01	10,244	5.39	9.82	6.65	14,200
	1935	5.0	9.5	8.1	11,000	5.4	9.9	6.7	16,000
	1936	5.2	9.8	8.2	11,500	5.5	10.0	6.9	16,500
	1937	5.3	10.0	8.5	12,010	5.5	10.8	7.1	18,000
	1938	5.2	10.3	9.0	11,100	5.3	11.4	7.3	16,500
	1939	5.44	10.67	9.38	10,200	5.30	11.52	7.56	14,500
New Jersey	1934	4.16	8.77	7.12	124,744	4.60	8.79	6.74	138,060
	1935	4.2	8.9	7.1	134,058	4.7	8.9	7.0	149,408
	1936	4.2	8.8	7.4	144,518	4.5	9.0	7.2	160,741
	1937	4.23	8.93	7.78	163,094	4.42	9.03	7.26	183,952
	1938	4.3	9.1	7.8	152,371	4.4	9.3	7.3	171,722
	1939	4.29	9.22	8.16	152,627	4.45	9.43	7.54	176,170
New Mexico	1934	4.0	12.5	4.0	50	1.79	20.38	0.20	1,221
	1935	4.0	12.3	4.0	50	2.8	28.7	0.2	1,636
	1936	4.3	12.0	4.1	100	2.9	28.7	0.5	2,667
	1937	4.3	11.5	4.4	100	3.0	30.0	0.5	3,218
	1938	4.9	10.6	4.6	52	3.1	34.3	0.1	2,240
	1939	4.13	12.73	4.50	50	3.25	35.38	0.12	2,243

Table I (*Continued*)

State	Year	All Mixed Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons	All Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons
New York	1934	3.90	9.86	6.34	161,000	4.02	10.60	5.16	230,000
	1935	4.0	10.0	6.4	179,000	4.2	10.6	5.0	285,000
	1936	4.1	10.1	6.5	190,000	4.3	10.8	4.9	315,000
	1937	4.1	10.4	6.6	198,000	3.8	12.9	4.3	350,000
	1938	4.2	10.5	6.8	196,552	3.5	13.4	4.3	332,881
	1939	4.27	10.68	7.03	184,600	3.16	14.06	4.41	323,980
North Carolina	1934	3.17	8.33	3.76	657,578	4.33	7.83	3.53	876,874
	1935	3.15	8.38	4.04	688,918	4.35	7.75	3.93	874,925
	1936	3.19	8.40	4.36	836,354	4.37	7.70	4.13	1,064,485
	1937	3.26	8.41	4.52	931,025	4.36	7.66	4.35	1,151,092
	1938	3.23	8.31	4.70	863,799	4.46	7.63	4.45	1,077,153
	1939	3.26	8.30	4.97	915,798	4.39	7.67	4.73	1,107,347
North Dakota	1934	2.1	14.5	4.2	40	0.3	21.2	0.6	300
	1935	1.8	13.9	2.2	150	0.5	20.	0.5	300
	1936	2.0	12.5	2.5	100	0.6	32.5	0.7	350
	1937	2.	14.	4.	150	1.	33.	1.	400
	1938	2.	14.	4.	150	1.	34.	1.	650
	1939	2.23	14.46	4.47	220	0.58	34.29	1.11	1,000
Ohio	1934	2.11	12.46	5.26	180,849	1.80	14.27	3.83	263,773
	1935	2.02	12.57	5.45	225,975	2.15	13.75	4.36	306,509
	1936	2.05	12.64	5.70	255,686	2.03	13.95	4.57	337,146
	1937	2.08	12.71	6.16	287,418	2.23	13.51	5.42	362,206
	1938	2.18	13.16	6.67	269,737	2.35	13.29	5.82	324,228
	1939	2.11	12.79	6.78	292,460	2.38	13.17	5.87	345,585
Oklahoma	1934	3.96	9.62	6.12	4,300	3.70	10.48	5.42	4,990
	1935	3.99	9.27	5.73	5,800	3.86	10.29	5.04	6,619
	1936	3.93	9.24	5.63	5,000	3.73	9.93	4.78	6,055
	1937	3.75	9.67	5.30	4,600	3.14	9.74	3.65	6,845
	1938	3.79	9.43	5.33	5,520	3.47	10.14	3.78	8,005
	1939	4.10	9.27	5.54	3,520	3.84	10.03	4.45	4,485
Oregon	1934	4.17	9.80	8.29	3,400	6.35	11.40	6.28	9,000
	1935	4.2	9.6	8.5	4,100	6.6	11.2	6.4	10,500
	1936	4.3	9.5	8.6	6,100	6.	15.	5.	14,300
	1937	4.4	9.4	8.8	7,200	6.	18.	4.	15,000
	1938	4.6	9.6	8.9	6,500	6.	20.	3.	14,500
	1939	4.83	9.68	9.50	4,000	5.81	21.33	2.75	12,750
Pennsylvania	1934	2.73	10.12	6.21	198,160	2.22	11.82	4.83	267,987
	1935	2.52	10.36	6.40	225,756	2.41	11.73	5.00	295,048
	1936	2.65	10.40	6.52	242,111	2.46	11.50	5.02	318,330
	1937	2.85	10.73	6.40	266,108	2.26	12.58	4.70	370,162
	1938	2.83	10.96	6.59	261,686	2.34	12.67	4.95	358,415
	1939	2.9	11.0	6.6	250,000	2.4	12.7	5.0	340,000
Puerto Rico	1934	9.37	6.03	10.66	91,980	11.84	4.81	8.16	120,809
	1935	9.7	6.1	10.9	83,700	11.86	4.97	9.02	110,125
	1936	10.0	6.3	11.1	115,000	10.93	5.11	8.79	146,302
	1937	10.3	6.4	11.3	137,252	10.02	5.45	8.06	170,913
	1938	10.70	6.62	11.51	130,919	9.96	5.62	9.41	159,701
	1939	11.56	6.27	11.83	98,768	12.82	5.66	9.90	123,099
Rhode Island	1934	4.76	8.76	7.27	9,411	5.14	9.19	6.36	11,553
	1935	4.9	9.1	7.3	7,500	5.1	9.3	6.4	10,000
	1936	5.1	9.3	7.4	8,000	5.6	9.4	6.5	10,000
	1937	5.2	9.4	7.6	9,000	5.6	9.6	6.7	11,000
	1938	5.3	9.6	7.8	10,100	5.3	10.0	6.9	12,200
	1939	5.31	9.97	8.01	8,700	5.54	10.20	7.11	11,000
South Carolina	1934	2.92	8.75	3.76	390,000	4.52	7.71	3.69	572,279
	1935	3.0	8.7	4.0	458,000	4.7	7.6	3.8	613,561
	1936	3.0	8.7	4.3	467,500	5.1	7.5	4.0	626,446
	1937	3.1	8.6	4.4	518,000	5.2	7.1	4.2	771,198
	1938	3.1	8.4	4.6	444,000	5.3	6.9	4.5	660,968
	1939	3.10	8.36	4.57	442,000	5.48	6.77	4.87	672,753

Table I (*Continued*)

State	Year	All Mixed Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons	All Fertilizers — Available N Per Cent	Available P_2O_5 Per Cent	Available K_2O Per Cent	Tonnage Short Tons
South Dakota	1934	2.1	14.4	4.2	9	4.	13.	3.8	10
	1935	4.1	12.8	3.9	10	0.5	40.	0.4	100
	1936						45.		100
	1937					1.	40.	1.	150
	1938					1.	40.	1.	150
	1939	12.1	6.5	4.3	5	0.25	43.43	0.07	300
Tennessee	1934	2.00	9.81	4.29	56,061	2.08	11.31	3.14	84,453
	1935	2.2	9.7	4.5	64,000	2.3	11.0	3.4	96,444
	1936	2.3	9.7	4.5	79,000	2.5	10.9	3.5	117,305
	1937	2.2	9.7	4.5	93,000	2.6	11.0	3.5	141,325
	1938	2.2	9.8	4.6	87,000	2.7	11.0	3.5	128,291
	1939	2.21	9.93	4.66	91,696	2.71	11.01	3.53	136,365
Texas	1934	4.50	10.31	5.01	34,533	4.67	11.38	4.09	47,204
	1935	4.58	10.38	5.08	47,962	5.06	11.26	4.34	61,802
	1936	4.48	10.18	4.84	46,662	5.01	11.53	4.03	65,549
	1937	4.45	9.73	4.82	69,409	5.21	10.90	4.17	84,938
	1938	4.59	9.71	4.59	62,073	5.32	11.41	3.78	79,640
	1939	4.54	9.46	4.43	74,967	5.19	11.08	3.71	93,115
Utah	1934					1.3	38.6	0.6	1,200
	1935					0.5	42.0	0.2	750
	1936	4.5	12.5	5.0	100	0.8	39.1	0.5	2,000
	1937	4.1	12.5	4.3	200	1.4	38.0	0.5	3,000
	1938	4.1	12.5	4.4	200	1.0	39.0	0.5	5,000
	1939	4.1	12.5	4.4	200	1.0	39.0	0.5	2,300
Vermont	1934	4.53	9.88	7.59	10,332	4.41	10.87	5.89	13,087
	1935	4.79	10.22	7.44	11,487	4.34	11.32	5.60	15,295
	1936	4.83	10.12	7.94	10,795	3.66	12.46	5.45	16,421
	1937	5.58	11.92	9.71	11,058	2.73	15.48	4.73	25,260
	1938	5.21	12.12	10.44	10,277	2.87	15.57	5.74	20,067
	1939	5.30	11.55	10.30	8,026	4.09	13.83	7.28	12,664
Virginia	1934	3.93	8.15	4.36	221,780	3.38	9.60	3.14	336,015
	1935	3.8	8.3	4.4	250,000	3.6	9.8	3.3	378,536
	1936	3.8	8.5	4.6	256,000	3.7	9.7	3.5	386,474
	1937	3.7	8.7	4.7	298,000	3.8	9.5	3.9	440,430
	1938	3.6	8.8	4.8	272,000	3.8	9.3	4.1	405,179
	1939	3.53	8.79	4.97	324,000	3.82	9.19	4.33	418,973
Washington	1934	4.58	9.30	7.93	6,000	7.56	8.51	4.87	14,500
	1935	4.7	9.2	8.1	6,600	7.0	8.8	5.1	16,500
	1936	4.7	8.9	8.4	9,500	6.7	9.3	5.6	23,300
	1937	4.2	9.4	8.8	12,000	5.9	10.2	6.2	28,000
	1938	4.3	9.6	9.5	13,000	5.6	10.8	6.6	27,000
	1939	4.44	9.70	10.45	8,100	5.92	12.16	6.54	23,750
West Virginia	1934	3.03	11.28	5.97	24,935	2.66	13.32	3.43	48,288
	1935	3.0	11.4	6.1	28,000	2.7	13.5	3.5	55,000
	1936	3.0	11.4	6.0	30,000	2.5	13.4	3.6	55,000
	1937	2.9	11.5	6.0	34,300	2.4	13.5	3.8	58,000
	1938	2.9	11.5	6.0	33,000	2.3	13.7	4.0	53,500
	1939	2.82	11.54	6.07	37,000	2.20	13.84	4.28	56,500
Wisconsin	1934	2.40	12.57	10.01	14,957	3.68	12.14	8.54	19,669
	1935	2.37	12.39	9.89	21,351	3.26	12.35	8.73	28,414
	1936	2.35	12.66	10.00	25,166	2.94	12.75	8.57	32,184
	1937	2.30	12.85	10.23	33,022	2.55	12.70	9.03	42,872
	1938	2.29	13.56	9.99	37,864	2.68	13.35	8.79	46,433
	1939	2.25	13.58	10.37	35,873	2.47	13.36	9.36	42,623
Wyoming	1934					0.6	43.6	0.2	1,640
	1935					0.2	44.0	0.3	1,500
	1936					0.4	43.0	0.5	1,600
	1937					1.2	41.9	1.0	1,800
	1938					0.9	42.8	0.8	2,200
	1939						45.0		2,033
United States	1934	3.55	9.18	5.37	4,095,818	4.74	9.12	4.52	5,809,185
	1935	3.49	9.32	5.51	4,482,356	4.79	9.18	4.72	6,389,512
	1936	3.61	9.29	5.69	5,046,872	4.87	9.19	4.82	7,201,155
	1937	3.68	9.34	5.84	5,851,815	4.91	9.25	4.96	8,379,985
	1938	3.72	9.41	6.09	5,325,622	5.00	9.23	5.14	7,675,870
	1939	3.74	9.43	6.18	5,473,932	5.04	9.17	5.23	7,738,769

average analyses show an overrun (an excess over the guarantee). The average overruns of N, P_2O_5 and K_2O are about 0.1 per cent, 0.5 per cent and 0.2 per cent, respectively. In a considerable number of states the control inspectors are instructed, insofar as is practicable, to collect for analysis one sample for each 100 tons, or some other definite quantity, of each brand found on the market. The average of the analyses of 100 or more samples collected in this way should give approximately the true plant food content of the fertilizer consumed in that state and year.

Some calculating was done to determine how closely the simple average analysis of a large number of samples collected in a given state and year does approximate the correct plant food content of the fertilizers actually consumed. For example, the average, weighted by tonnages, of each grade of complete fertilizer sold in North Carolina in 1936 was calculated to be 3.21-8.18-4.09[3] and the simple average of the guarantees of the corresponding control samples reported in the 1936 North Carolina bulletin was found to be 3.18-8.37-4.08. Similar comparisons were made in a number of cases where both kinds of data were available. Since agreement of this kind was obtained in all cases, it is assumed that, in general, the simple average may be accepted as approximately correct where no bias exists in the manner of collecting samples and large numbers of samples are collected.

The only form of bias known that could seriously affect the averages of analyses of mixed fertilizers as published by control officials is due to the practice in a number of states of collecting only one or two samples of each registered brand no matter how much of each is consumed. The possibility of getting reasonable results by averaging analyses made in these states was discussed at length with the control officials of a number of the states involved. The majority of these gentlemen expressed the opinion that the average of the analyses of their samples of mixed fertilizers would roughly approximate the real composition of the fertilizers consumed. This opinion was based on the fact that the most popular grades in any given section of a state are registered by all companies doing business in that section and some companies have several brands of the same grade, while unusual grades are generally registered by one company only. On the other hand, the fear was also expressed that the presence of samples of very different composition from the average but representing very small tonnages might seriously throw off the average.

Delaware is typical of the states in question. In the 1933-34 grade survey for Delaware the highest reported consumption of any grade was of the 2-8-5 grade and the 1934 control report contains analyses of more samples of 2-8-5 brands than of any other, namely, 25. The average grade of all complete mixtures weighted by tonnage of each is 2.82-8.24-6.26. The average guarantee of the samples analyzed is 2.98-8.69-6.43. The average grade of the P-K mixtures by tonnage is 0-11.85-5.36 and by samples is 0-12.25-5.99. In the case of both kinds of fertilizer mixtures the averages of the samples gave slightly high results, due no doubt to the inclusion in this case of a number of samples of double-strength grades out of proportion to the tonnage of these grades sold. The figures from the two sources of information, however, are roughly of the same order and indicate that when nothing better is available the analyses of brands do give a rough approximation of the truth.

Methods of Calculation

State tonnage statistics of fertilizer consumption were used, whenever obtainable, to determine the plant food content by the following method. First, the weighted average grades of each class of fertilizer were calculated from the tonnages of the different grades consumed. The overruns were then computed from the guarantees and found analyses published in the control bulletin for the same state and year. The appropriate overrun was then added to the weighted average grade to give the actual N, P_2O_5 and K_2O contents of each of these classes. Weighted averages for all mixtures were then obtained from the figures for the different classes of mixtures. Finally, the plant food content of all fertilizers was determined from the tonnages and composition of the different classes of mixtures and materials. When state tonnage figures were not obtainable either from publications or by correspondence, the data from the N. F. A. grade surveys were used in the same way. Where tonnage by grade figures were available, satisfactory guaranteed and found analyses were also available for all states that consumed more than an annual average of 10,000 tons of fertilizers as well as for some of those consuming smaller amounts, except Illinois and Kentucky. Such figures were published for Kentucky also for 1932 and 1938. Overruns for Kentucky for the intervening years were interpolated from these. Overrun

[3] Percentages of N, P_2O_5 and K_2O, respectively.

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August Crop Report

Crop prospects in the United States declined during July and probably held about steady through the first week of August. Though hot dry weather the last half of July sharply reduced the corn outlook in some areas of the Middle West, and heavy rains in the central Gulf States were unfavorable for cotton, the cool weather of early July in the central and eastern Corn Belt was very favorable for small grains. While somewhat less than the usual acreage is being grown this year, yields per acre for all crops combined are expected to average about 9 per cent higher than during the pre-drought decade (1923-1932) and only about 3 per cent lower than in 1938 and 1939. Aggregate crop production is expected to be about average, and considering stocks on hand, supplies of most crops will be ample.

With generally favorable weather in early July, the estimates for winter wheat and oats were increased materially, and the estimates for barley, flaxseed, beans, and some fruits were increased slightly. But late crops—corn, sorghums, late hay crops, and tobacco—were damaged by dry weather, and pastures and ranges deteriorated over a wide area. Prospects for sweet potatoes and sugar cane also declined. Crop conditions are quite uneven, the scattered rains of July and early August leaving numerous dry spots, particularly in the southern portion of the Corn Belt and in the central and southern parts of the Great Plains. A general need for rain, and local shortages of irrigation water are reported from the intermountain region of the West.

With July weather favorable for small grains and unfavorable for corn, the forecasts of production show numerous changes from those of a month ago. Winter wheat prospects are markedly above earlier expectations and present conditions indicate a crop of about 556 million bushels. With spring wheat prospects about the same as a month ago, total wheat production is expected to be about 761 million bushels, or about an average crop. Rye will be close to average and rice production is forecast at 55 million bushels—nearly 3 million bushels above last year's production and 2 million above the record crop of 1937. Bean production is expected to be about 14,600,000 bags, which would be about a million bags below the peak in 1937, but the third highest to date. Preliminary reports on peanuts that farmers expect to harvest indicate a large acreage to be picked or threshed and a production of 1½ billion pounds—17 per cent above the high

record set in 1938. Potatoes appear to have grown well so far, and the indicated production of 374 million bushels would be about 2 per cent above the 1929-38 average production, but would provide less than the usual number of bushels per capita. Sweet potatoes show prospects for a below-average yield on the smallest acreage in 10 years. Sugar beet acreages and prospects indicate about 10½ million tons to be harvested, about 2 per cent below last year's production, but more than were harvested in previous years, except two. Sugar cane has not done so well and the tonnage for sugar is expected to be 10 per cent less than it was last year.

Supplies of commercial vegetables are expected to be ample. Production so far this season has been about 3 per cent larger than in 1939 and 14 per cent above the 10-year (1929-38) average. Production in areas shipping this month is also expected to be slightly higher than it was last year. Prospects for late vegetable crops indicate about a third more domestic cabbage and about a sixth less onions than in 1939. The first section of late States are expected to show a slightly smaller production of cantaloups, tomatoes, and lettuce than last year but most other late vegetable crops will show increases.

Fruit prospects point to about the usual per capita supply of all kinds combined, the period of excessively hot weather which prevailed in many sections during the month apparently causing no serious damage to these crops except in a few local areas. The combined production of peaches, pears, grapes, cherries, plums, prunes, apricots, and commercial apples, is indicated to be about 12 per cent smaller than in 1939, but about average. The commercial apple crop, estimated at a little under 117 million bushels, is a few per cent below the 10-year average, but pear production is well above average, and the tonnage of grapes is expected to be about 12 per cent above average. Citrus fruits from the 1940 bloom (for the 1940-41 marketing season) developed under rather favorable conditions during July in most of the important producing areas, and indications now point to large crops of these fruits.

Crop	Total Production (in thousands) 1939	Indicated July 1, 1940	Indicated August 1, 1940
Corn, all, bu.	2,619,137	2,415,998	2,248,246
Wheat, all, bu.	754,971	728,644	760,623
Winter, bu.	563,431	523,990	555,839
All spring, bu.	191,540	204,654	204,784
Durum, bu.	34,360	34,954	34,179
Other spring, bu.	157,180	169,700	170,605
Oats, bu.	937,215	1,031,622	1,121,619
Barley, bu.	276,298	287,377	289,812
Rye, bu.	39,249	36,848	37,452
Buckwheat, bu.	5,739	....	5,993
Flaxseed, bu.	20,330	28,801	29,279
Rice, bu.	52,306	54,267	55,971
Grain sorghums, bu.	83,102	....	105,095
Hay, all tame, ton	75,726	85,301	83,383
Hay, wild, ton	8,800	8,862	8,760
Hay, clover and timothy,[1] ton	23,640	28,840	28,261
Hay, alfalfa, ton	27,035	30,490	29,851
Beans, dry edible, 100-lb. bag	13,962	14,111	14,649
Peanuts,[2] lb.	1,179,505	....	1,521,705
Potatoes, bu.	364,016	371,263	374,314
Sweet potatoes, bu.	72,679	68,800	65,673
Tobacco, lb.	1,848,654	1,291,685	1,262,087
Sugarcane for sugar, ton	6,197	5,874	5,609
Sugar beets, ton	10,773	10,019	10,553
Broomcorn, ton	30	....	40
Hops, lb.	[3]39,380	39,868	39,460
Apples, com'l crop, bu.	143,085	....	116,721
Peaches, total crop, bu.	[3]60,822	52,436	53,290
Pears, total crop, bu.	[3]31,047	31,240	31,372
Grapes,[4] ton	2,526	2,422	2,489
Pecans, lb.	63,639	....	73,665

[1] Excludes sweetclover and lespedeza.

[2] Picked and threshed.

[3] Includes some quantities not harvested.

[4] Production includes all grapes for fresh fruit, juice, wine, and raisins.

FERTILIZER MEN ESCAPE FROM WAR ZONE

Word has been received that L. Osterweil and Roger Tuteur, directors of the Belgian fertilizer concern of Tuteur & Co., Brussels, were fortunate in escaping from Belgium at the time of the German invasion. Mr. Osterweil is now residing in Forest Hills, Long Island, N. Y.

Obituary

A. D. GEOGHEGAN

A. D. Geoghegan, president of the Southern Cotton Oil Co., died on August 1st from a heart attack following illness from peritonitis. He was 63 years of age.

Born in Mississippi, Mr. Geoghegan started his business career as a stenographer in a New Orleans cotton brokerage house. In 1900 he started out in business for himself as a dealer and exporter in cottonseed products. In 1925 he acquired the stock of the Southern Cotton Oil Co. and combined this company and the Southport Mill, Ltd., which he also owned, under the name of the Wesson Oil & Snowdrift Company.

July Tag Sales

Fertilizer tax tag sales in July were somewhat below the corresponding month of recent years, according to reports of State control officials to The National Fertilizer Association. Sales during the month are comparatively small, having accounted for only 1 per cent of the annual total in the last three years.

Total sales in the 17 States in the first seven months of the year, January through July, were 65,000 tons larger than in the corresponding period of 1939. They were 400,000 tons below 1937, which marked the peak in fertilizer consumption in recent years.

An increase of only 9,000 tons was reported by the South over the first seven months of last year. Excluding Virginia and North Carolina, however, there was an increase of 164,000 tons. It is apparent that if it had not been for the reduction in tobacco acreage this year the increase in fertilizer tonnage would have been considerably larger. The largest percentage increases reported in the South this year have been in Arkansas and Texas. In these two States sales have been substantially larger this year than they were in 1937. Louisiana and Tennessee have also reported sales which have been slightly above 1937. Sales in January-July in each of the five reporting midwestern States were well above the corresponding period of last year.

FERTILIZER TAX TAG SALES

State	July				January-July			
	1940		1939	1938	1939-40		1939	1938
	Per Cent of 1939	Tons	Tons	Tons	Per Cent of 1939	Tons	Tons	Tons
Virginia	85	4,041	4,776	3,962	93	295,376	317,428	302,811
N. Carolina	57	2,751	4,862	4,892	88	971,605	1,104,882	1,002,046
S. Carolina	146	2,150	1,475	1,710	100	636,654	636,389	624,834
Georgia	272	1,553	570	2,901	107	712,773	664,744	699,219
Florida	81	16,184	19,986	20,109	108	306,884	284,789	292,701
Alabama	64	1,400	2,200	850	102	560,100	546,650	521,550
Mississippi	10	1,250	12,050	207	106	293,095	277,646	298,161
Tennessee	146	1,805	1,234	650	105	121,648	116,319	110,115
Arkansas	100	100	100	750	144	93,450	64,972	62,600
Louisiana	20	20	102	2,000	107	132,681	123,578	123,972
Texas	354	1,275	360	60	128	103,181	80,734	71,972
Oklahoma	150	300	200	10	90	5,748	6,398	6,680
Total South	69	32,829	47,915	38,101	100	4,233,195	4,224,529	4,116,661
Indiana	139	4,862	3,500	13,051	123	198,244	160,814	140,609
Illinois	...	0	150	12	122	36,198	29,725	30,217
Kentucky	...	438	0	3,575	104	96,700	92,556	94,898
Missouri	132	86	65	61	125	26,265	20,933	24,809
Kansas	...	2,085	0	5	330	4,798	1,455	3,567
Total Midwest	201	7,471	3,715	16,704	119	362,205	305,483	294,100
Grand Total	78	40,300	51,630	54,805	101	4,595,400	4,530,012	4,410,761

BRADLEY & BAKER

FERTILIZER MATERIALS - FEEDSTUFFS

AGENTS - IMPORTERS - BROKERS

155 E. 44th Street
NEW YORK

BRANCHES

Clinton St. & Danville Ave.
Baltimore, Md.

505 Royster Building
Norfolk, Va.

1252 West Beaver Street
Jacksonville, Fla.

FERTILIZER MATERIALS MARKET

NEW YORK

Only Moderate Movement of Fertilizer Materials. Sulphate of Ammonia Scarce with Premium Offered for Export Material. Potash Supplies Expected to be Ample.

Exclusive Correspondence to "The American Fertilizer."

NEW YORK, August 14, 1940.

As is usual at this time of the year, movement of fertilizer materials is moderate. All domestic markets are quiet, with sulphate of ammonia being one article that continues difficult to obtain. Export demand continues at a price well over the domestic list and because of this several domestic buyers have expressed willingness to pay premium for certain quantities, even though this material is wanted for domestic use.

There is also no excess quantity of muriate of potash available but, because of withdrawal of practically all offerings of this material for export, present indications are that there will be ample available material for domestic use.

Nitrate of Soda

The price for August delivery was released on July 31st, price of $27.00 in bulk being unchanged and same as price for July delivery.

Castor Pomace

There is no change in the price of this material but demand for immediate shipment has been very light.

Fish Scrap

There has been no offerings of Japanese fish meal in this market and practically no sales of domestic fish scrap have been consummated lately.

Dried Blood

There is no change in the market for this material and South American is still being quoted at $2.35 ($2.85½ per unit N), but no demand.

Nitrogenous Material

Additional orders for domestic nitrogenous are few and far between as most of the buyers have contracted for their needs.

BALTIMORE

Summer Lull Continues. Sulphate of Ammonia Still Scarce. Potash Market Tightening Up.

Exclusive Correspondence to "The American Fertilizer."

BALTIMORE, August 13, 1940.

Business in fertilizer materials during the past two weeks has been more or less along routine lines, as the vacation season is now on, and the fall season still at least another month off.

Ammoniates.—South American tankage and ground dried blood are still obtainable at $2.75 to $2.80 per unit of nitrogen, and the market on domestic tankage for fertilizer is about the same level, f.o.b. producing point, but interest is at a minimum.

Nitrogenous Material.—There is nothing new as far as this commodity is concerned, and the nominal market continues to be quoted at $2.55 to $2.65 per unit of nitrogen for domestic productions.

Sulphate of Ammonia.—Offerings of this material for domestic consumption are practically nil, although there is still considerable buying to be done, as most of the manufacturers have not been able to cover for their entire requirements for the coming season. In the meantime, the demand for export continues fairly active, with only limited offerings at prices considerably above the schedule for domestic use.

Nitrate of Soda.—Neither importers or producers have yet issued prices on this commodity in bags for delivery beyond the current month. The price for August delivery is $27.00 per ton of 2,000 lb., in bulk, and $29.00 per ton of 2,000 lb., in 100-lb. bags, ex warehouse, port.

Fish Scrap.—The market on unground menhaden fish is ruling somewhat easier, and it is now possible to buy at the equivalent of $4.07 per unit of nitrogen, f.o.b. fish factories, for

FERTILIZER MATERIALS

LET US QUOTE YOU ON YOUR REQUIREMENTS OF THESE MATERIALS

PHOSPHATE ROCK
SUPERPHOSPHATE
DOUBLE SUPERPHOSPHATE
NITRATE *of* SODA
SULPHURIC ACID
SULPHATE *of* AMMONIA
BONE MEALS
POTASH SALTS
DRIED BLOOD
TANKAGES
COTTONSEED MEAL
BONE BLACK
PIGMENT BLACK
SODIUM FLUOSILICATE

ARMOUR FERTILIZER WORKS

General Offices: Walton Building, Atlanta, Ga.

Division Sales Offices:

Albany, Ga.
Atlanta, Ga.
Augusta, Ga.
Baltimore, Md.
Birmingham, Ala.
Chicago Heights, Ill.
Cincinnati, Ohio
Columbia, S. C.
Columbus, Ga.
East St. Louis, Ill.
Greensboro, N. C.
Havana, Cuba
Houston, Texas
Jacksonville, Fla.
Montgomery, Ala.
Nashville, Tenn.
New Orleans, La.
New York, N. Y.
Norfolk, Va.
Presque Isle, Me.
San Juan, P. R.
Sandusky, Ohio
Wilmington, N. C.

shipment "if and when made," but as this price is so far out of line with the prevailing market on other feeding materials, there is very little interest being shown.

Superphosphate.—The market continues firm and unchanged at $8.00 per ton of 2,00 lb., basis 16 per cent for run-of-pile, and $8.50 for flat 16 per cent grade, both in bulk, f.o.b. sellers' works, Baltimore.

Bone Meal.—Both raw and steamed bone continue to lag on account of price situation. 3 and 50 per cent domestic bone is quoted at $32.00 to $34.00 per ton of 2,000 lb., while 4½ and 50 per cent raw bone meal is quoted at $31.50 to $32.00 per ton, c.i.f. Baltimore.

Potash.—The position of the market on this material is gradually tightening up, although it is anticipated that stocks on hand and estimated domestic production will be sufficient to supply a normal season's requirements. Domestic manufacturers, however, are not taking on any new business, and in the meantime stocks in the hands of fertilizer manufacturers are more than ample for current requirements. There has been some export inquiry but from all accounts very little of it has developed into definite business as manufacturers are disposed to conserve their stocks.

Bags.—The burlap market has eased up considerably during the past two weeks and the present price of plain, new, 10-oz. bags, basis 40 cut 54 in., is $106.00 per thousand delivered Baltimore for fall or spring shipment.

CHICAGO

Fertilizer Organic Market Quiet with Stocks Low. Lack of Demand Noticeable in Feed Market.

Exclusive Correspondence to "The American Fertilizer."

CHICAGO, August 12, 1940.

The organic market continues quiet. The lack of inquiry seems to develop, if anything, an easier feeling. If stocks in sellers' hands were not so light, this slow situation could readily cause a decided break. Sellers, however, are in a more or less favorable position, and still confidently look for improvement in demand as we approach the fall season.

A weaker tone is evident in the feed market, caused principally by lack of consumer demand. Prices of finished feeds were reduced but created no buying response.

Nominal prices are as follows: high grade ground fertilizer tankage, $2.00 to $2.25 ($2.43 to $2.73½ per unit N) and 10 cents; standard grades crushed feeding tankage, $2.40 to $2.50 ($2.91½ to $3.04 per unit N) and 10 cents; blood, $2.40 to $2.45 ($2.91½ to $2.98 per unit N); dry rendered tankage, 47 to 52½ cents per unit of protein, Chicago basis.

TENNESSEE PHOSPHATE

Price Advance of Ground Rock Stimulates Shipments. Great Increase in Truck Transportation. Local Technical Society Formed.

Exclusive Correspondence to "The American Fertilizer."

COLUMBIA, TENN., August 12, 1940.

Shipments of phosphate rock to farmers for direct application to the soil began a little earlier than usual this year, the last week in July having witnessed shipments equal to any previous week in August/September, the season of customary largest shipment.

This was partly due to the weather conditions in the consuming areas, permitting farmers' work to be considerably advanced, partly to the increase of contract spreading by truckers who haul the rock from cars to farms and spread it direct on the fields, so that farmers do not have to interrupt other work to unload and spread phosphate, and partly due to the advance in price in Illinois, effective August 1st, which caused many August requirements to be anticipated in July.

Manufacturers' Sales Agents for **DOMESTIC**

Sulphate of Ammonia

Ammonia Liquor :: Anhydrous Ammonia

HYDROCARBON PRODUCTS CO., INC.

500 Fifth Avenue, New York

The Illinois Agricultural Association, Phosphate and Limestone Department, gives the rock phosphate used in Illinois for direct application as 50,000 tons in 1939, while the rail shipments into that area show only 27,000 tons, indicating that the railroads have already lost 46 per cent of this business to trucks.

This is the natural and to be expected result of the freight rate situation which the railroads have permitted themselves to be drawn into, by favoring the fertilizer manufacturers with low commodity rates to points where factories are located, with necessity of same low rates to all intermediate points along direct lines of routing.

Naturally the farmers have their phosphate shipped to the nearest low rate point and truck it, frequently seventy-five miles or more, landing it on their farms for less than the rate to their nearest station. This tends to increase the contract trucking and spreading business referred to, and results in a large increase of 20 ton cars instead of the usual 40 ton cars taken by average Illinois farmers, as the difficulty of synchronizing time and available number of trucks is less with twenty tons. This increases the chance of the farmer not taking the second twenty ton car and so tends to decrease the tonnage consumed. Then the next step is to send a load of grain down to the higher markets in Tennessee and bring back six tons of phosphate instead of returning empty, and the chance of making all six trips to get the usual forty tons, is still further minimized, and the tonnage of rock phosphate is still further reduced.

With the increase of truck business, the producers are finding it necessary to establish new loading facilities, as all of the plants were designed to ship entirely by rail, making truck shipments much more expensive loading at the plants, both because of smaller loads and greater interference with normal operations. With new facilities, this can, of course, be corrected.

The Middle Tennessee Technical Society was recently organized by operators and others interested in the phosphate and other industries in Middle Tennessee, with H. R. Mosely of TVA, President, and L. E. Grissom of Charleston Mining Co., Mt. Pleasant, Secretary-Treasurer, and about thirty charter members.

BEMIS BAG NOW HANDLING SUPER-LOOPER SALES

Sales of the portable bag-sewing device known as the "Super-Looper" are now being handled by the Bemis Bro. Bag Co. This apparatus which weighs only 8 pounds and is operated by the friction generated by the bag as the machine is drawn across, has proven a useful supplement to power-driven bag closing machines, and a big improvement over hand sewing. A card or tag can be sewn on the bag during the closing operation, the card being fed into place automatically through a slot in the machine. Information and prices on this device can be obtained from the main office of Bemis Bro. Bag Co., 411 Poplar St., St. Louis, Mo., or from any of their numerous branch factories and sales offices.

The Super-Looper Bag Closer.

PULVERIZED MASCOT LIMESTONE
Trade Mark Registered

MAGNESIUM LIMESTONE
"It's a Dolomite"
American Limestone Company
Knoxville, Tenn.

NO FAMINE HERE!

...THANKS TO POTASH FROM NEW MEXICO

WINTER wheat to be profitable must be well fed. Starved soils mean famine crops. It is estimated that a good acre yield of wheat removes 100 pounds of essential plant foods from the soil. Keeping wheat lands fertile means the adequate use of the right grade of complete fertilizer compounded to fit local conditions of soil and climate.

Potash develops larger heads, plumps out kernels, and makes heavier grains . . . helps the production of quality and quantity crops.

Sunshine State Potash is highly regarded by all fertilizer producers because they can depend upon its uniform analysis . . . careful sizing that means easy handling, blending . . . nation-wide delivery system.

HIGRADE MURIATE OF POTASH
62/63% K_2O
Also 50% K_2O Grade
MANURE SALTS
Approximately 30% K_2O

REG. U. S. PAT. OFF.

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.

UNITED STATES POTASH COMPANY, INC., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

August Cotton Report

A United States cotton crop of 11,429,000 bales is forecast by the Crop Reporting Board of the United States Department of Agriculture, based upon information gathered as of August 1st. Such a production would be 388,000 bales, or 3.3 per cent, less than the 1939 crop, and 2,118,000 bales, or 15.6 per cent, less than the 10-year (1929-38) average.

The average yield for the United States is forecast at 222.3 pounds per acre, which is 15.6 pounds less than the 1939 yield, but 24.2 pounds more than the average of 198.1 pounds per acre.

The cotton acreage of 24,616,000 acres used in this report is the estimated acreage in cultivation on July 1st, less the 10-year average abandonment. The acreage is 811,000 acres, or 3 per cent, more than finally harvested in 1939, but 8,550,000 acres, or 26 per cent, less than the average of 33,166,000 acres. The Board secured such information as was available concerning the number of acres which would be removed in order to comply with the Agricultural Conservation Program, and made due allowance for such reduction in acreage to be harvested in determining the probable production.

The reports from crop correspondents indicate that the crop in the Mississippi Delta and in Alabama and Tennessee is from one week to 12 days late, due to late plantings and frequent rains and cool weather until late July. In Texas and Oklahoma, the crop is only a few days late; in Georgia, less than a week late; while in the Carolinas, it is average or earlier.

Reports received up to August 1st concerning weevil presence and activity indicate a light prospective loss from this source in Virginia and the Carolinas. In Georgia, Alabama, Louisiana, Arkansas and Texas, prospective loss is indicated near to average. In Mississippi and Oklahoma, a relatively light loss is indicated. For the United States as a whole, prospective loss from this source is less than last year and less than average.

State	Production (Ginnings)[1] 500 lb. gross wt. bales: Average, 1929-38 1,000 bales	1939 Crop 1,000 bales	1940 Crop Indicated Aug. 1 1,000 bales
Missouri	270	437	306
Virginia	37	13	20
N. Carolina	658	457	588
S. Carolina	820	871	840
Georgia	1,175	915	955
Florida	34	11	19
Tennessee	472	449	451
Alabama	1,200	785	796
Mississippi	1,619	1,582	1,313
Arkansas	1,283	1,413	1,315
Louisiana	709	745	496
Oklahoma	812	526	630
Texas	3,876	2,846	2,893
New Mexico	99	102	112
Arizona	154	202	221
California	315	443	459
All other	15	20	15
UNITED STATES	13,547	11,817	11,429
Sea Island[2]	...	1.7	4.1
Amer. Egyptian[2]	17	28	45
Lower Calif. (Old Mexico)[3]	42	40	48

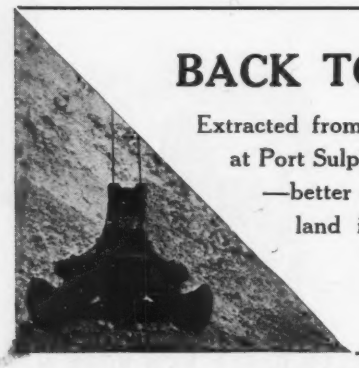
[1] Allowances made for interstate movement of seed cotton for ginning.

[2] Included in State and United States totals. Sea Island grown principally in Georgia and Florida. American Egyptian grown principally in Arizona.

[3] Not included in California figures, nor in United States total.

COOPERATIVE FERTILIZER GROUP RE-ELECTS OFFICERS

Stockholders of the Cooperative Fertilizer Service, an organization managed jointly by the Southern States Cooperative of Richmond, Va.; the Pennsylvania Farm Bureau, of Harrisburg, and the Cooperative Farm Service,

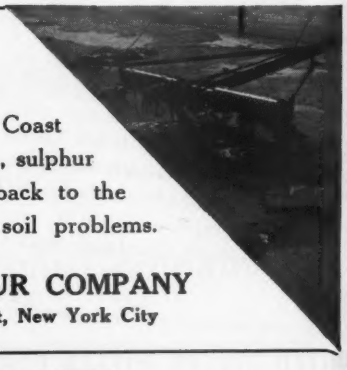


BACK TO THE LAND

Extracted from deposits beneath the Gulf Coast at Port Sulphur, La., and Freeport, Tex., sulphur —better than 99½% pure—goes back to the land in fertilizer to help solve soil problems.

FREEPORT SULPHUR COMPANY

122 East 42nd Street, New York City



MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

UREA NITROGEN

Like Natural Organics is low in equivalent acidity!

THE amount of acidity developed by "Uramon" and Urea-Ammonia Liquors is about the same as that developed by an equivalent amount of dried blood or other high-grade natural organic fertilizer.

UREA NITROGEN, by the Pierre method, has an acidity equivalent to 36 pounds of calcium carbonate per unit of nitrogen. This applies to all Urea-Ammonia Liquors.

"Uramon" has an acidity equivalent to 33 pounds of calcium carbonate, or 70 pounds per 100 pounds of product.

The initial effect of UREA NITROGEN on the soil reaction is alkaline; reduces soil acidity. Thus, while the long-time or residual effect is slightly acid, Urea first reduces the acidity of the soil solution, due to formation of ammonium carbonate. This initial alkaline effect produces an environment favorable to the efficient absorption of ammonia nitrogen by the seedling.

Natural organic nitrogen materials and water-soluble organics are the only nitrogenous fertilizer materials that produce this desirable effect. Use of "Uramon" fertilizer compound and Urea-Ammonia Liquors makes it possible to increase the content of such secondary elements as calcium and magnesium (supplied, for instance, by dolomite) and reduce the acidity even of concentrated mixtures.

"URAMON"
FERTILIZER COMPOUND
REG. U. S. PAT. OFF.

DU PONT
REG. U. S. PAT. OFF.

UREA-AMMONIA
LIQUORS

E. I. DU PONT DE NEMOURS & CO. (INC.)
AMMONIA DEPARTMENT, WILMINGTON, DELAWARE

of Clarksburg, W. Va., at an annual meeting in a Baltimore hotel, re-elected the following:—President, Dr. T. K. White, of Richmond; first vice-president, A. B. Poat, of Clarksburg; second vice-president, H. S. Agster, of Harrisburg; executive vice-president, Max F. Borden, of Baltimore; secretary and treasurer, A. Preston Sale, Jr., of Richmond; comptroller, O. E. Zacharias, Jr., of Richmond, and manager, T. B. Ingram, of Baltimore.

COTTONSEED MEAL PRODUCTION LOWER

The figures of the U. S. Bureau of Census for the crop year ended July 31, 1940 show an output of 1,880,438 tons of cottonseed meal during the past 12 months, as compared with 2,023,341 tons during the 1938-39 crop year. The production of hulls totaled 1,054,748 tons in 1939-40, and 1,161,079 tons in 1938-39. Total receipts of cottonseed at the mills were 4,066,507 tons in 1939-40, and 4,259,555 tons in 1938-39.

HARDING APPOINTED V-C COLUMBIA MANAGER

The Virginia-Carolina Chemical Corporation has appointed C. T. Harding to the position of manager of the Columbia, S. C., office. Mr. Harding has been connected with the company for 22 years, his latest position being assistant sales manager of the Carteret, N. J., office. At Columbia he will succeed A. N. Myers, who resigned to become first vice-president of Chilean Nitrate Sales Corporation.

NEW MEMBERS OF STANDARD PHOSPHATE BOARD

At the recent annual meeting of the Standard Wholesale Phosphate & Acid Works, Baltimore, vacancies on the Board of Directors were filled by the election of Arthur H. Bryant, Jr. and Henry A. Koehler to the places formerly held by the late Arthur Herbert and by J. W. Tillett, who had resigned. Mr. Koehler was also appointed vice-president in charge of the acid plant.

AVERAGE PLANT FOOD CONTENT OF FERTILIZERS IN THE UNITED STATES 1934-1939

(Continued from page 11)

figures for adjoining states were used for Illinois.

Tonnages of the different grades and kinds of fertilizers consumed were obtainable for nearly all states for at least one of the five years under review. The exceptions, for which none at all was available, were a few of the Rocky Mountain states and the territory of Hawaii. For these cases a less accurate method than the one outlined above had to be employed.

When tonnage figures by grades were lacking the analyses as reported in state control bulletins, were averaged to obtain figures for mixed fertilizers. For all fertilizers, however, this simple procedure is not satisfactory since the number of samples of the fertilizer materials collected and analyzed is seldom in proportion to the tonnage of these materials sold, as compared with commercial mixtures. In order to estimate the tonnages of each kind of fertilizer consumed where they were not known, as well as to adjust the figures for mixtures, some or all of the following kinds of pertinent facts were considered: (1) the proportionate tonnages of the same classes of fertilizers in the year or years for which they had been determined for the same state; (2) similar figures for the same year for the adjoining states having most nearly the same agricultural conditions; (3) estimates obtained by correspondence with officials of state departments of agriculture, experiment stations, and fertilizer companies; (4) imports through the appropriate customs districts; (5) potash deliveries by states as reported by the American Potash Institute; (6) the 1938 consumer survey made by the N. F. A.; (7) miscellaneous statistics on file in this office that have a bearing on the subject; and (8) known trends in the industry.

Only commercial fertilizers were included in this work. Thus, the fertilizers distributed by the Tennessee Valley Authority, etc., are excluded. Dried manures, natural guanos, etc., were considered to be fertilizer materials.

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MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

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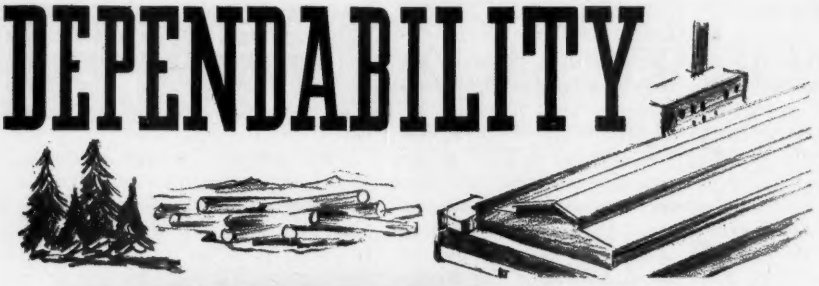

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ONE-MAN PACKAGE EASY TO HANDLE

Nitrophoskas, on the contrary, were included with complete mixtures.

The total consumption figures given in the last column of the table are largely those published in the 1939 American Fertilizer Hand Book. In instances where the Hand Book figures were based on tag sales and the actual consumption figures are known from state tonnage reports the latter are used. The figures for Hawaii were estimated after correspondence with the Pacific Guano Co. and authorities in Hawaii. In the case of a few of the Rocky Mountain states for certain years the present estimates are higher than the previously accepted figures and there is every reason to believe that they are more nearly correct.

In some cases total tonnages reported in grade surveys were large enough to be representative, but were known to be incomplete. In these cases the percentages of N, P_2O_5 and K_2O were accepted on the basis of the tonnages reported on the assumption that the unreported tonnage was of the same kind as that reported. This is without doubt largely true, because in most cases the companies failing to cooperate were doing the same kind of business as those reporting.

For all cases where complete or fairly complete tonnage figures by grades were available either from State or N. F. A. surveys the results are given in Table 1 to the second decimal place. It is believed that these results are on the whole as accurate as it is practicable to get them at present. They are probably correct in every case at least to the first decimal place. Those determined from less complete surveys or by other methods are given to the first decimal place or whole number only. The results based largely on estimates are given only to the whole number and are probably correct to within 1.0 per cent. The figures in the table involving any estimating are given to one more significant place than is believed to be most probably correct.

Results

The present study shows that the average percentages of N, P_2O_5, and K_2O in fertilizers are all increasing. The greatest gains in the past five years have been made by potash. The contents of nitrogen and of potash in commercial mixtures have been climbing steadily for 20 years, but from 1929 to 1934 the P_2O_5 content fell considerably. Since the latter year P_2O_5 in mixed fertilizers has regained a small part of its previous loss.

Although the average nitrogen content of mixed fertilizers increased from 3.55 to 3.74 per cent between 1934 and 1939 in the United States as a whole, it decreased in some states. In New York the nitrogen content of mixed fertilizers increased, but that of all fertilizers decreased due to a very marked increase in the consumption of superphosphate in that state. In Florida, Illinois, Kansas, and Washington, the average nitrogen contents of both mixed and all fertilizers declined.

The average P_2O_5 content of mixed fertilizers consumed in the United States increased from 9.18 to 9.43 per cent in the last five years, but that of fertilizers consumed in the Gulf States decreased. The P_2O_5 content of the average superphosphate, exclusive of double superphosphate, has increased almost continuously from 11.01 per cent in 1880 to 17.95 per cent in 1935 and 18.89 per cent in 1939. The average P_2O_5 content of all fertilizers declined slightly from 1937 to 1939.

Potash appears to have maintained or bettered its position relatively to N and P_2O_5 in nearly all states, notable exceptions being Minnesota and Iowa. The potash content of fertilizers sold in Hawaii has greatly increased in the 5-year period.

The inclusion of values for Hawaii and Puerto Rico in the averages for the United States results in slightly different figures than are obtained for the continental United States only. This is due to the large tonnages consumed in these islands and the relatively large proportions of N and K_2O. The average fertilizer consumed in the continental part only of the United States contained 4.36 per cent nitrogen, 9.28 per cent P_2O_5 and 4.43 per cent K_2O in 1934, and 4.75 per cent nitrogen, 9.29 per cent P_2O_5 and 5.10 per cent K_2O in 1939.

The total plant food content of fertilizers appears to have declined somewhat in Florida, Louisiana, and Oklahoma in recent years. It has increased very markedly in most of the

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Sales Agents:
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Information and references available on request.

AMERICAN POTASH & CHEMICAL CORPORATION

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Pioneer Producers of Muriate of Potash in America

See Page 4

others. For the United States as a whole it rose from 14 per cent in 1920 to 18.38 per cent in 1934 and to 19.44 per cent in 1939.

The economic forces favoring an upward trend in the total plant food content of fertilizers are now stronger than ever. This increased plant food content is, in general, in the interest of both the farmer and the fertilizer industry, because it results in cheaper plant food for the consumer and in better business in the industry. The gradual elimination of grades of mixed fertilizers containing less than 18 per cent of total plant food, therefore, appears to be inevitable.

Acknowledgment

Grateful acknowledgment is hereby made for the use of unpublished fertilizer data that were compiled by the following: B. D. Cloaninger, Head, South Carolina Department of Fertilizer Inspection and Analysis; L. D. Haigh, Chemist, Missouri Fertilizer Inspection; R. W. Ludwick, Deputy in Charge, New Mexico Feed and Fertilizer Control Office; R. V. Mayo, Chief Chemist, Puerto Rico Chemical Control Laboratory for Fertilizers; W. T. McGeorge, Administrator, Arizona Feed and Fertilizer Control Office; L. S. Walker, Chemist in Charge, Vermont Fertilizer Control; and R. E. White, Supervisor, Washington Division of Feeds and Fertilizers. Assistance was also generously given by officials of several fertilizer companies, as well as by various other individuals connected with the industry.

Summary

The average N, P_2O_5 and K_2O contents of the fertilizers consumed in the United States and in each of its major subdivisions were determined for the years from 1934 to 1939, inclusive.

The average analysis of commercial mixed fertilizers for the United States, including Hawaii and Puerto Rico, rose from 3.55-9.18-5.37 in 1934 to 3.74-9.43-6.18 in 1939. The corresponding results for all fertilizers are 4.74-9.12-4.52 and 5.04-9.17-5.23.

Excluding the island territories, the average analysis of mixed fertilizers consumed in 1939 in the United States was 3.51-9.55-5.99 and of all fertilizers was 4.82-9.30-5.01.

The N and K_2O contents of fertilizers increased in nearly all states. The P_2O_5 content also increased in the New England and Northwestern states and in Hawaii, but decreased in the Gulf states.

The total plant food content of all fertilizers consumed in the entire United States rose from 18.38 per cent in 1934 to 19.44 per cent in 1939.

SULPHATE OF AMMONIA PRODUCTION STILL INCREASING

The monthly figures issued by the U. S. Bureau of Mines show that during June, 58,514 tons of byproduct sulphate of ammonia were produced, a slight increase over the May output of 57,697 tons, but about 35 per cent above the production for June, 1939. During the first half of 1940, a total of 340,707 tons was recorded, as compared with 249,906 tons in the same half of 1939.

Byproduct ammonia liquor has been running at about the same level of production for some months. The figures for June, 1940, were 2,191 tons (NH_3 content); 2,209 tons for May, 1940; 1,938 tons for June, 1939; 13,485 tons for January-June, 1940; 11,011 tons for January-June, 1939.

NACO STARTS NEW PLANT

It is reported that the Naco Fertilizer Company (formerly the Nitrate Agencies, Inc.) will shortly open a plant at Findlay, Ohio. The company, whose head offices are in New York, operates plants at Wilmington, N. C., Charleston, S. C., Jacksonville, Fla., and San Juan, Puerto Rico.

CLASSIFIED ADVERTISEMENTS

Advertisements for sale of plants, machinery, etc., and for help and employment, in this column, same type as now used, 60 cents per line, each insertion.

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BUYERS' GUIDE

A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

ACID BRICK
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

ACID EGGS
Chemical Construction Corp., New York City.

ACIDULATING UNITS
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMO-PHOS
American Cyanamid Co., New York City.

AMMONIA—Anhydrous
Barrett Company, The, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA LIQUOR
Barrett Company, The, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA OXIDATION UNITS
Chemical Construction Corp., New York City.

AMMONIATING EQUIPMENT
Sackett & Sons Co., The A. J., Baltimore, Md.

AUTOMATIC ELEVATOR TAKEUPS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BABBITT
Sackett & Sons Co., The A. J., Baltimore, Md.

BAGS AND BAGGING—Manufacturers
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.

BAGS—Paper
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS (Waterproof)—Manufacturers
Bemis Bro. Bag Co., St. Louis, Mo.
Fulton Bag & Cotton Mills, Atlanta, Ga.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, East Point, Ga.
Bagpak, Inc., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

BAG-CLOSING MACHINES
Bagpak, Inc., New York City.

BAG PILERS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.

BEARINGS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BELT LACING
Sackett & Sons Co., The A. J., Baltimore, Md.

BELTING—Chain
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BELTING—Leather, Rubber, Canvas
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

BOILERS—Steam
Atlanta Utility Works, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Work, Atlanta, Ga.
Huber & Company, New York City.

BONE PRODUCTS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Work, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.
Pacific Coast Borax Co., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Keim, Samuel L., Philadelphia, Pa.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BUCKETS—Elevator
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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NORTH CAROLINA BANK BLDG., WILMINGTON, N. C.
Menhaden Fish Products and Fertilizer Materials

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 33

BUCKETS—For Hoists, Cranes, etc., Clam Shell, Orange Peel, Drag line, Special; Electrically Operated and Multi Power
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

BURNERS—Sulphur
Chemical Construction Corp., New York City.

BURNERS—Oil
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CABLEWAYS
Hayward Company, The, New York City.

CALCIUM-NITRATE
Synthetic Nitrogen Products Co., New York City.

CAL-NITRO
Synthetic Nitrogen Products Co., New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.

CARS—For Moving Materials
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARTS—Fertilizer, Standard and Roller Bearing
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

CASTINGS—Acid Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

CASTINGS—Iron and Steel
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CEMENT—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

CHAIN DRIVES—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAINS AND SPROCKETS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAMBERS—Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CHEMICAL APPARATUS
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

CHEMICALS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Company, The, New York City.

CHEMICALS—Continued
Bradley & Baker, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
Wellmann, William E., Baltimore, Md.

CHEMICAL PLANT CONSTRUCTION
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

CLUTCHES
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CONCENTRATORS—Sulphuric Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CONDITIONERS AND FILLERS
American Limestone Co., Knoxville, Tenn.

CONTACT ACID PLANTS
Chemical Construction Corp., New York City.

COPPER SULPHATE
Tennessee Corporation, Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

CRANES AND DERRICKS
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CYANAMID
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

DENS—Superphosphate
Chemical Construction Corp., New York City.
Stedman's Foundry and Mach. Works, Aurora, Ind.

Andrew M. Fairlie
CHEMICAL ENGINEER
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CABLE ADDRESS: "SULFACID ATLANTA"

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A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

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DISINTEGRATORS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DOUBLE SUPERPHOSPHATE (See Superphosphate—Concentrated)

DRYERS—Direct Heat
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

DRIVES—Electric
Link-Belt Company, Philadelphia, Chicago.

DUMP CARS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DUST COLLECTING SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELECTRIC MOTORS AND APPLIANCES
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ELEVATORS AND CONVEYORS—Portable
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ENGINES—Steam
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

EXCAVATORS AND DREDGES—Drag Line and Cableway
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.

FERTILIZER MANUFACTURERS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Farmers Fertilizer Co., Columbus, Ohio.
International Agricultural Corp., New York City.
Smith-Rowland Co., Norfolk, Va.
U. S. Phosphoric Products Corp., New York City.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GARBAGE TANKAGE
Wellmann, William E., Baltimore, Md.

GEARS—Machine Moulded and Cut
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GEARS—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

GELATINE AND GLUE
American Agricultural Chemical Co., New York City.

GUANO
Baker & Bro., H. J., New York City.

HOISTS—Electric, Floor and Cage Operated, Portable
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.

HOPPERS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.

LACING—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

LOADERS—Car and Wagon, for Fertilizers
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Coal and Ash Handling
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, East Point, Ga.
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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MACHINERY—Power Transmission
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Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Pumping
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MACHINERY—Tankage and Fish Scrap
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Sackett & Sons Co., The A. J., Baltimore, Md.
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MAGNESIA
California Chemical Co., New York City.

MAGNETS
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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MANGANESE SULPHATE AND CARBONATE
Tennessee Corporation, Atlanta, Ga.

MANGANESE SULPHATE
Tennessee Corportion, Atlanta, Ga.

MIXERS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Company, The, New York City.
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

NITRATE OVENS AND APPARATUS
Chemical Construction Corp., New York City.

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Smith-Rowland Co., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

NOZZLES—Spray
Monarch Mfg. Works, Inc., Philadelphia, Pa.

PACKING—For Acid Towers
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

PANS AND POTS
Stedman's Foundry and Mach. Works, Aurora, Ind.

PHOSPHATE MINING PLANTS
Chemical Construction Corp., New York City.

PHOSPHATE ROCK
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American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
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Huber & Company, New York City.
International Agricultural Corp., New York City.
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Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

PIPES—Chemical Stoneware
Chemical Construction Corp., New York City.

PIPES—Wooden
Stedman's Foundry and Mach. Works, Aurora, Ind.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Synthetic Nitrogen Products Co., New York City.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

POTASH SALTS—Manufacturers and Importers
American Potash and Chem. Corp., New York City.
Potash Co. of America, Baltimore, Md.
United States Potash Co., New York City.

PULLEYS AND HANGERS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

PUMPS—Acid-Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

PYRITES—Brokers
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Baker & Bro., H. J., New York City.
Jett, Joseph C., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

QUARTZ
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

RINGS—Sulphuric Acid Tower
Chemical Construction Corp., New York City.

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Wellmann, William E., Baltimore, Md.

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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCRAPERS—Drag
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

SCREENS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Including Vibrating
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Magnetic
Sackett & Sons Co., The A. J., Baltimore, Md.
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SHAFTING
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHOVELS—Power
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill. and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SPROCKET WHEELS (See Chains and Sprockets)

STACKS
Sackett & Sons Co., The A. J., Baltimore, Md.

SULPHATE OF AMMONIA
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
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Bradley & Baker, New York City.
Huber & Company, New York City.
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Snythetic Nitrogen Products Co., New York City.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

SULPHUR
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Texas Gulf Sulphur Co., New York City.

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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.

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Huber & Company, New York City.
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Taylor, Henry L., Wilmington, N. C.
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Wellmann, William E., Baltimore, Md.

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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
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Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
U. S. Phosphoric Products Corp., New York City.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Agricultural Corp., New York City.
U. S. Phosphoric Products Corp., New York City.

SYPHONS—For Acid
Monarch Mfg. Works, Inc., Philadelphia, Pa.

TALLOW AND GREASE
American Agricultural Chemical Co., New York City.

TANKAGE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
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Schmaltz, Jos. H., Chicago, Ill.
Smith-Rowland Co., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

TANKAGE—Garbage
Huber & Company, New York City.

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Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

TILE—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

TOWERS—Acid and Absorption
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

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Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

UREA
Du Pont de Nemours & Co., E. I., Wilmington, Del.
Snythetic Nitrogen Products Co., New York City.

UREA-AMMONIA LIQUOR
Du Pont de Nemours & Co., E. I., Wilmington, Del.

VALVES—Acid-Resisting
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
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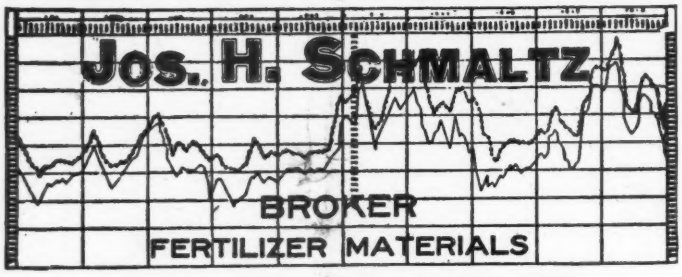

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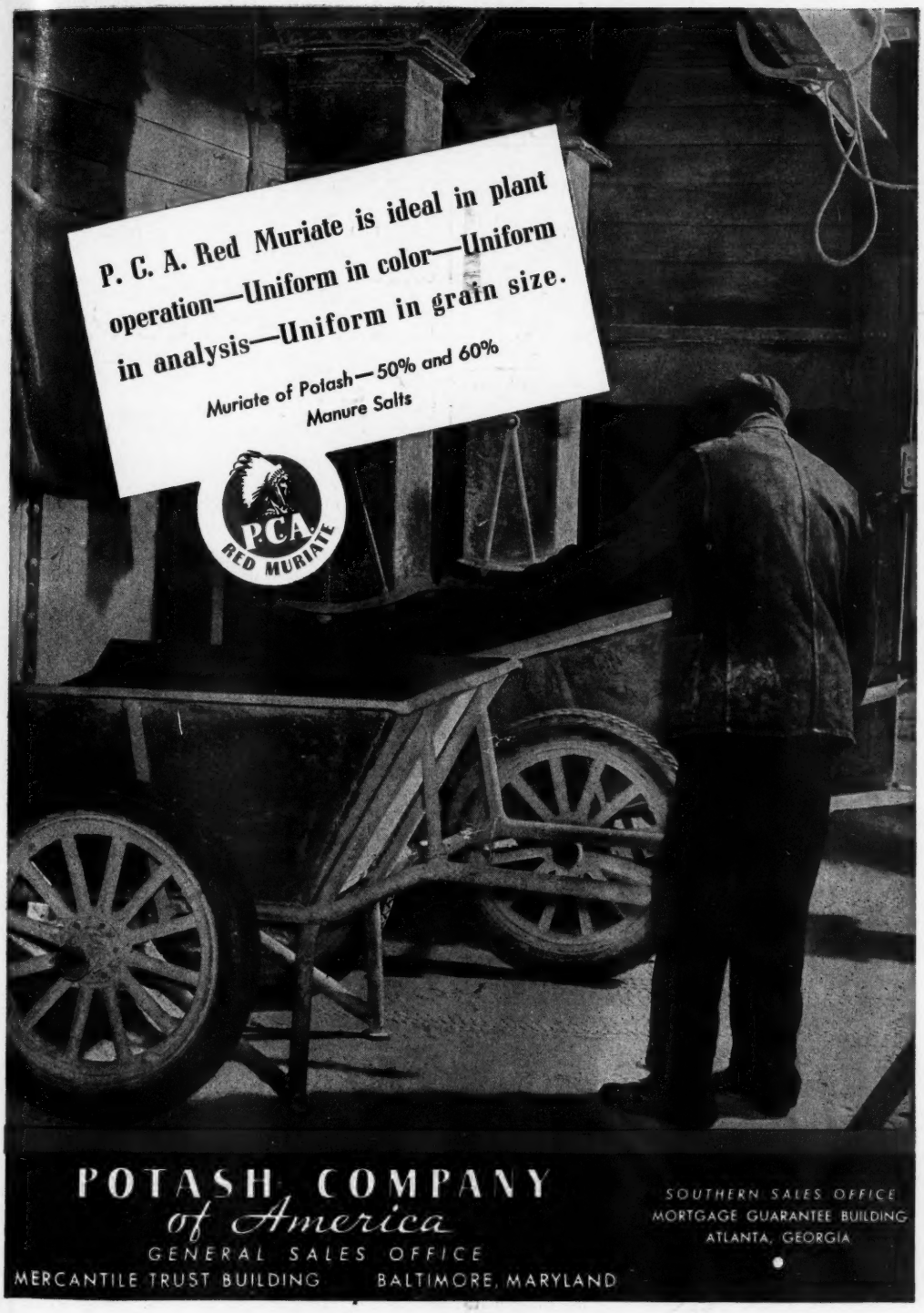
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